

BOTSULA, R.A.

Eclipsing variable TX Herculis [with summary in German].  
Per.svezdy 11 no.1:26-41 Ja '56. (MLRA 10:2)

1. Astronomicheskaya observatoriya im. V.P. Engel'gardta.  
(Stars, Variable)

BOTSULA, R.A.

Electrophotometric observations of 32 Cygni. Astron.tsirk. no.173:18-  
19 0 '56. (MIRA 10:1)

1. Astronomicheskaya Observatoriya imeni Engel'gardta.  
(Stars, Variable) (Photometry, Astronomical)

BOTSULA, R.A.

Variable star 32 Cygni (  $\alpha^2$  Cygni) [with summary in French].  
Per. svezdy 11 no.6:438-447 My '57. (MIRA 12:1)

1.Astronemicheskaya observatoriya imeni Engel'gardta.  
(Stars, Variable)

BOTSULA, R.A.

Publishing electrophotometric observations of 32 Cygni. Astron.  
tsir. no.189:18-19 F '58. (MIRA 11:8)

1.Astronomicheskaya observatoriya im. V.P. Engel'gardta (pri  
Kazanskom gosudarstvennom universitete), Kazan'.  
(Stars, Variable)

S/035/61/000/001/004019  
A001/A001

Translation from: Referativnyy zhurnal, Astronomiya i Geodeziya, 1961, No. 1, pp. 21 - 22, # 1A194

AUTHORS: Botsula, R.A., Sharov, A.S.

TITLE: Correlation of Changes in Brightness and Spectrum of Pleione

PERIODICAL: "Peremennyye zvezdy", 1959, Vol. 12, No. 6, pp. 398 - 409

TEXT: The luminosity curve of Pleione was plotted from 108 observations of different authors during the period from 1879 to 1959. All stellar magnitudes are given in the B system of Johnson-Morgan. Reduction of the Pleione observations taken from different sources to a single system is described in detail. The luminosity curve is presented graphically. During the interval from 1900 to 1936, the star maintained a constant brightness. By the end of 1939 Pleione became less luminous by more than  $0^m.4$ , then a rapid increase was set in, and in 1942 its luminosity was only slightly lower than the maximum one. In 1943 the luminosity dropped again. The second minimum was observed in 1945 - 1946. By 1957 the star came back to its initial luminosity ( $B \simeq 4^m.94$ ). The change in the luminosity of

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## Correlation of Changes in Brightness and Spectrum of Pleione

the star was accompanied by changes in its color. From 1950 to 1959 the color index of Pleione ( $B-V=0^m08$ ) was constant. In 1930 the color was the same, in 1939 color excess amounted to  $+0^m08$ ; at the end of 1942 and in the beginning of 1943 it was  $+0^m02$  to  $+0^m03$ , in 1948-1949  $+0^m03$ . The spectrum and luminosity of Pleione were correlated. Prior to 1935 at the maximum brightness, Pleione was a normal rapidly rotating star of spectral class B8. In 1938 a strong emission in  $H\alpha$  was noted for the first time. Emission in hydrogen lines appears the latest in the spectrograms. Variations of emission intensity and its individual components have some correlation with the course of the luminosity curve. In 1938, at the epoch of the first minimum, were noticed absorption lines of hydrogen and metals - the lines of the envelope. The intensity of the lines in the Pleione spectrum was varying all the time. A graph of ionization variation in the envelope was presented according to data obtained by O.Struve. Probably in 1938-1940 ionization increased, from 1940 it was decreasing and became the lowest during the second minimum, then began to grow again. Fluctuations of radial velocity are considered. Measurements of the spectrograms in 1941-1942 showed oscillations of the velocity of the envelope with a period of about 4 months and an amplitude of 10 km/sec. The comparison of variations of various Pleione characteristics shows that the

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**Correlation of Changes in Brightness and Spectrum of Pleione**

maximum intensification of absorption lines, minimum ionization, weakening of emission, and the beginning of a noticeably stratification of the envelope by velocities occurred during the years of the second minimum, which possibly was due to an increase in the amount and density of matter in the envelope. The end of the second minimum is connected with the dispersion of the envelope. For the first minimum is characteristic a strongly asymmetric emission; no characteristic, except symmetry of emission, is connected with the increase between the minima. The origin of the first minimum and the central growth of luminosity remains as yet unclear. In 1884 occurred apparently a weakening of luminosity, analogous to the second minimum, as can be concluded from photometric and spectral data. There are 42 references. ✓

N. Perova

Translator's note: This is the full translation of the original Russian abstract.

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Botsula, R.A.

PHASE I BOOK EXPLOITATION

SOV/4728

Kazan' Universitet. Astronomicheskaya observatoriya

Byulleten', no. 35 (Bulletin of the Astronomical Observatory, Kazan'  
State University imeni V. I. Ul'yanov-Lenin, No. 35) [Kazan'] 1960. 80 p.  
No. of copies printed not given.

Sponsoring Agencies: Ministerstvo vysshego i srednego spetsial'nogo  
obrazovaniya RSFSR; Kazanskiy ordena trudovogo krasnogo znameni  
gosudarstvennyy universitet imeni V. I. Ul'yanova-Lenina.

No contributors mentioned.

**PURPOSE:** This booklet is intended for astronomers, radio and electronics  
engineers, and physicists. It may be used by advanced students of astronomy.

**COVERAGE:** This issue of the Bulletin of the Astronomical Observatory imeni  
Engel'gardt contains 6 articles reflecting work carried on at that institute  
during the last decade. Individual papers deal with radar observations

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Bulletin of the Astronomical (Cont.)

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of meteor activity and the equipment used in such studies including a new ZTL-180 zenith telescope. Photoelectric observations of AR Cassiopeia, RR Lynx, and SX Auriga are covered in the papers. References accompany individual articles.

TABLE OF CONTENTS:

Kostylev, K. V., Yu. A. Pupyshchev, and V. V. Sidorov. Equipment Used at the Astronomical Observatory imeni Engel'gardt for Radar Observations of Meteors 1  
The authors describe the registration unit used in conjunction with the Observatory's three KGY-M1 radar installations to record on film both basic data on meteor activity and the distribution of radio echoes according to three amplitude levels. A schematic diagram of the photo attachment shows the unit to consist of three parts: 1) signal group (basic unit which detects signal, chooses first-level amplitude, selects width, and forms pulse of selected signal which then proceeds to the electron-ray tube modulator of the recording oscillograph; 2) scan group (scan and trigger on a twin triode fixes meteor reflection on the film in the form of a double point); and 3) the service group (records time, distance, and other data). A block diagram is given of an additional unit used to obtain information on the static distribution of the amplitudes of the radar

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reflections from meteor trails. Finally, the authors describe the operation and present the schematic diagram of the "artificial meteor" device which is capable of generating a simulating pulse of the meteor signal. The authors note the difficulty of finding the true levels of amplitude discriminations of the real signal. The authors thank N. D. Kalinenkov and A. I. Urmatskiy. There are 5 references, all Soviet.

Pupyshev, Yu. A. Review of Radar Observations of Meteor Activity Made in the Astronomical Observatory imeni Engel'gardt From May 1956 Through August 1958 18

Rabinskiy, P. M. Determining the Values of the Graduations of the Talcott Levels of the New ZTL-180 Zenith Telescope in the Astronomical Observatory imeni Engel'gardt 24

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Botsula, R. A. Photoelectric Observations of the Eclipsed Variable RR Lynx 43

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Lavrov, M. I. Investigation of SX Auriga, Part 1: Photoelectric Curve of  
Luminosity

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BOTSULA, R.A.; SHAROV, A.S.

Searching for variable stars in open stellar clusters and  
associations. Per.zvezdy 13 no.2:101-111 N '60. (MIRA 14:10)

1. Astronomicheskaya observatoriya imeni V.P.Engel'gardta i  
Gosudarstvennyy astronomicheskiy institut imeni P.K.Shternberga.  
(Stars, Variable)

L 19336-63

EWI(1)/BDS/ES(v)

AFFTC/ASD/ESD-3/APGC/SSD

Pe-4/P1-4

GW

ACCESSION NR: AR3002042

S/0269/63/000/005/0027/0027

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SOURCE: RZh. Astronomiya. Otdel'nyy vypusk. Abs. 5.51.275

AUTHOR: Botsula, R. A.

TITLE: Some results of observations of atmospheric transparency at the Astronomical Observatory im. V. P. Engel'gardta

CITED SOURCE: Byulleten' Astronomicheskoy observatorii, im. V. P. Engel'gardta, no. 36, 1961, 8-27

TOPIC TAGS: atmospheric transparency, star color

TRANSLATION: The author presents the results of a study of atmospheric transparency at the Astronomical Observatory im. Engel'gardta with a 12" refractor equipped with electrophotometer. As a radiation detector, he used a FEU-17 photomultiplier with BG1 and GG1 filters, for blue and yellow light respectively. He determined the coefficients of attenuation, their variation with time, and place and the color of stars for the blue-yellow color indices for the particular electrophotometer. The observations were made in 1954. It was found that the variation in the absorption coefficients for color indices from night to night,

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and also in the course of several hours on the same night, and the azimuthal effect, have the same value. The attenuation coefficient, evidently also has seasonal variations. He discusses the errors involved in reductions for star color indices by the V. B. Nikonov method (standard star method), and also by the "conditional coefficients" method. He presents formulas for computing the increase of systematic error. The author presents certain considerations relating to the choice of stars with use of the mean coefficient of attenuation. Bibliography of 10 items. V. Popov

DATE ACQ: 30May63

SUB CODE: AI

ENCL: 00

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BOTSULA, R.A.

Photographic observations of short-period eclipsing variable  
star 4937. Per. zvezdy 14 no.2:135-136 Je '62.  
(MIRA 17:2)

1. Astronomicheskaya observatoriya imeni Engel'gardta,  
Kazan'.

BOTSULA, R.A.

Attempt to explain the seasonal variation in AOE electrophotometer observations by a temperature-dependent change in photomultiplier sensitivity. Izv. AOE no.34:140-143 '63.

(MIRA 18:4)



BOTSVADZ, V.I. (Tbilisi).

Retention of a lower canine in the case of three supernumerary  
teeth. Stomatologiya 37 no.4:69 J1-Ag '58 (MIRA 11:9)  
(~~TEETH~~—ABNORMALITIES AND DEFORMITIES)

<sup>T</sup>  
BO~~R~~SVADZE, E. Sh. Cand Med Sci -- (diss) "Functional  
state of the liver in dysentery (<sup>on the basis of</sup> ~~according to~~ nitrogen~~ous~~  
Metabolism ~~exchange~~)."  
<sup>State Pub House of Med Literature</sup>  
Tbilisi, Georgian~~ian~~, 1958, 26 pp.  
(Tbilisi State Med Inst) 200 copies (KL, 21-58, 92)

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*BOTSVADZE, E.V.*

BIBINEYSHVILI, M.B.; BOTSVADZE, E.V.

Rare case of gangrene of the lower extremity following measles.  
Pediatrics no.8:60-61 Ag '57. (MIRA 10:12)

1. Iz kafedry infektsionnykh zabolevaniy (zav. - prof. G.V.  
Kvitashvili) Tbilisskogo meditsinskogo instituta.  
(GANGRENE) (MEASLES)

BOTSVADZE, T.D.

Forms of class struggle in Kabardia during the first half of the  
19th century. Soob. AN Gruz. SSR 27 no.6:797-801 D '61.  
(MIRA 15:2)

1. Institut istorii im. akad.I.A.Dzhavakhishvili, AN Gruzinskoy  
SSR, Tbilisi. Predstavleno chlenom-korrespondentom AN Gruzinskoy  
SSR G.S.Chitaya.

(Kabardian A.S.S.R.—Class struggle)

BOTSVADZE, V.L.; NISHNIANIDZE, G.S.

Work of the orthodontic room of the Tiflis Children's Stomatological  
Polyclinic in 1953-1954. Stomatologiya 35 no.4:62-63 J1-Ag '56

(MIRA 10:4)

(TIFLIS--TEETH--ABNORMITIES AND DEFORMITIES)

BOTSVADZE, V.L. (Tbilisi)

On the possibility of orthodontic treatment of adults. Stomatologia  
36 no.2:61 Kr-Ap '57. (MIRA 10:6)

(~~TEETH~~--ABNORMALITIES AND DEFORMITIES)

BOTSVADZE, V.L.

Results of treating pseudoprogeria with an apparatus of  
functional and mechanical action. Stomatologiya 43 no.1:  
101 Ja-F'64 (MIRA 17:4)

1. Tbilisskaya detskaya tsentral'naya stomatologicheskaya  
poliklinika (glavnyy vrach G.S. Nishnianidze).

BOTSYAN, TSetsiliva Vladimirovna

[Significance and characteristics of contracts between collective farms and government organizations] Znachenie i osobennosti dogovornykh otnoshenii kolxozov s gosudarstvennymi organizatsiyami. Kiev, Izd-vo Akad. nauk Ukrainskoi SSR, 1957. 150 p.  
(Agriculture and state) (MIRA 10:6)



BOTSYAN, Tsetiliya Vladimirovna

[New features in the statutes of agricultural cooperatives] Nove  
v statutakh sil'skohospodarskykh artilei. Kyiv, Akademiia nauk  
Ukrainskoi BSR, 1958. 60 p. (MIRA 11:10)  
(Collective farms)

GRINBERG, Ya.M., dotsent; GRIGOR'YEV, P.S.; BOTSYURA, N.N.; GOL'DBERG, B.M.;  
NOSOVA, N.P.

Some problems concerning the etiology and clinical aspects of  
chronic hepatitis. Kaz. med. zhur. no.5:8-10 S-0'63

(MIRA 16:12)

1. Fakul'tetskaya terapevticheskaya klinika (zav. - prof.  
N.Ye. Kavetskiy) Kuybyshevskogo meditsinskogo instituta.

DARABANT, St., ing.; BOTTA, A., ing.

Flax and hemp shaff, a valuable raw material for industry.  
Ind text Rum 15 no.10:510-513 0 '64.

1. Technical Director, D.G.I.I.C.-Ministry of Light Industry  
(for Darabant). 2. D.G.I.I.C.-Ministry of Light Industry (for  
Botta).

BÖTTCHER, Z.,; PIENIAZEK, E.

Instrument for testing the cooperation of cylindrical  
gears. Mechanik 37 no.5:280 My'64.

1. Communication Equipment Factory, Wroclaw.

*BOTTE, A. V. Ukraine*

DATSENKO, Ivan Kostyantynovich; FELIKH, Volodimir Maksimovich; SHAGOMYALO, Valentin Illich; SHAGOMYALO, Marko Illich; ~~BOTTE, O.V.~~ redaktor; YURCHENKO, P.M.; redaktor; VOLKOVA, M.K., tekhnichnyi redaktor

[Automobiles; a manual for students in secondary schools] Avtomobil'; posibnyk dlia uchniv seredn'oi shkoly. Kyiv, Derzh.uchbovo-pedagog. vyd-vo "Radians'ka shkola," 1957. 351 p. (MLBA 10:9)  
(Automobiles)

*BOTTE A.V.*

GAVRILOV, V.D.; BOTTE, O.V.

*Ukraine*

The Second Ukrainian Conference of Young Scientists. Visnyk  
AN USSR 28 no.5:53-58, My '57. (MIRA 10:7)  
(Ukraine--Technology)

BOTTE, A.V.

KUYUN, G.I.; BOTTE, O.V. *Ukraine*

*A.I.*

Development of scientific and technological information in the  
institutions of the Department of Technology of the Academy of  
Sciences of the Ukrainian S.S.R. Visnyk AN URSR 28 no.9:73-76  
S '57. (MIRA 11:1)

(Ukraine--Technology)

KUYUN, A.I.; BOTTE, A.V.

Anniversary session of the Department of Technical Sciences of the  
Academy of Sciences of the Ukrainian S.S.R. Prykl. mekh. 4 no.1:  
112-113 '58. (MIRA 11:4)  
(Academy of Sciences of the Ukrainian S.S.R.)



KUYUN, O.I.; BOTTE, O.V.

Defense of dissertations at the institutes of the Department of  
Technical Sciences of the Academy of Sciences of the Ukrainian  
S.S.R. in 1957. Prykl.mekh. 4 no.3:355-356 '58. (MIRA 13:8)  
(Academy of Sciences of the Ukrainian S.S.R.)

KUYUN, O.I.; BOTTE, O.V.

Session of the Department of Technical Sciences of the Academy of  
Sciences of the Ukrainian S.S.R. on the scientific activity of  
the institutes in 1957. Prykl.mekh. 4 no.3:352-354 '58.

(MIRA 13:8)

(Academy of Sciences of the Ukrainian S.S.R.)

BOTTE, A.V. [Bette, O.V.]

Session of the Academy of Sciences of the Ukrainian S.S.R. Prykl.  
mekh. 4 no.4:475 '58. (MIRA 11:12)  
(Academy of Sciences of the Ukrainian S.S.R.)

KUYUN, O.I.; BOTTE, O.V.

Defense of dissertations in institutes of the Department of  
Technology of the Academy of Sciences of the Ukrainian S.S.R. in  
1958. Prykl. mekh. 5 no.3:348-350 '59. (MIRA 13:2)  
(Technology)

BOTTE, A.V. [Botte, O.V.]

Session of the Department of Technology of the Academy of Sciences  
of the Ukrainian S.S.R. in Lugansk. Prykl. mekh. 5 no.4:455-456  
'59. (MIRA 13:3)

(Academy of Sciences of the Ukrainian S.S.R.)

BOTTE, A.V. [Botte, O.V.]

Defense of dissertations at the institutes of the Department of Technological Sciences of the Academy of Sciences of the Ukrainian S.S.R. Prykl.mekh. 6 no.2: 235-237 '60. (MIRA 13:8)  
(Mechanics)

BOTTE, A.V. [Botte, O.V.]

Session of the Department of Technical Sciences of the  
Academy of Sciences of the Ukrainian S.S.R. Prykl.mekh.  
6 no.3:357-358 '60. (MIRA 13:8)  
(Academy of Sciences of the Ukrainian S.S.R.)

BOTTE, A.V. [Botte, O.V.]

Defense of dissertations in the Department of Technology of the  
Academy of Sciences of the Ukrainian S.S.R. in 1960. Prykl.mekh.  
7 no.4:459-462 '61. (MIRA 14:9)

(Technology)

(Academy of Sciences of the Ukrainian S.S.R.)



BOTTE, A.V. [Bottle, O.V.]

Session of the Department of Technology of the Academy of Sciences  
of the Ukrainian S.S.R. Prykl.mekh. 7 no.5:573-575 '61.  
(MIRA 14:10)

(Academy of Sciences of the Ukrainian S.S.R.)

BOTTE, A.V. [Botte, O.V.]

Technologists elected to the Academy of Sciences of the Ukrainian  
S.S.R. Prykl.mekh. 7 no.5:576-577 '61. (MIRA 14:10)  
(Academy of Sciences of the Ukrainian S.S.R.)

BOTTE, A.V. [Botte, O.V.]

Session of the Department of Technical Sciences of the Academy of  
Sciences of the Ukrainian S.S.R. Prykl.mekh. 8 no.4:458-461 '62.  
(MIRA 15:9)

(Academy of Sciences of the Ukrainian S.S.R.)

BOTTE, A.V. [Botte, O.V.]

Defense of dissertations in the field of mechanics at  
institutions of the Department of Technology of the Academy  
of Sciences of the Ukrainian S.S.R. in 1962. Prykl. mekh. 9  
no.4:455-458 '63. (MIRA 16:8)

S/198/61/007/004/004/004  
D218/D305

**AUTHOR:** Botte, O.V.

**TITLE:** Defence of theses in the institutes of the department of technical sciences of the Academy of Sciences of the UkrSSR in 1960

**PERIODICAL:** Prykladna mekhanika, v. 7, no. 4, 1961, 459 - 462

**TEXT:** In 1960, research students and assistants at the Institutes of the Department of Technical Sciences of the AS UkrSSR defended 35 theses for the degree of Candidate of Technical and Physico-Mathematical Sciences, and 5 theses for the degree of Doctor. (the corresponding figures for 1959 were 32 and 4 respectively). In addition 10 doctors' and 62 candidates' theses were prepared for defence in 1960. The following list gives the details of theses defended at these Institutes in 1960 in the field of mechanics and related subjects: 1) Instytut hydrolohiyi ta hidrotekhniki (Institute of Hydrology and Hydraulics): On November 14, 1960,

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Defence of theses in the ...

Senior Scientific Assistant, Candidate Izrayil' L'vovych Rozovs'kyy defended his doctor's thesis on "The Motion of Water at a Bend in an Open Channel", Academician of the AS UkrSSR Y.H. Sukhomel. Doctor I.I. Levi and Doctor A.K. Ananyan presiding. On April 29, 1960, Junior Scientific Assistant Ivan Oleksandrovykh Rodionov defended his Candidate thesis on "The Distribution of Velocity and Hydraulic Pressure in a Plane Stream with Uniform Fluid Motion", Doctor A.M. Mkhytaryan and Candidate V.V. Smyslov presiding. On June 17, 1960, Junior Scientific Assistant Ivan Anykiyovych Asaulenko defended his Candidate's thesis "Hydrostatic Pressure in the Movement of Water and Aqueous Mixtures in Pipes of Large Diameter", Doctor A.M. Mkhytaryan and Candidate I.L. Rozovs'kyk presiding. 2) Instytut mekhanyky (Institute of Mechanics): On April 26, 1960, Junior Scientific Assistant Vil'yam Feodosiyovych Yankevych defended his Candidate's thesis on "Structural Variation in Metal under the Action of a Stream of Dense Gas at High Temperature", Doctor V.I. Prosvirin and Candidate Yu.B. Malyevs'kyk presiding. On May 10, 1960 Kyva Abramivna Mozniker defended her Candidate's thesis

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Defence of theses in the ...

on "Vibrations of a Vibratory Device with Electromagnetic Oscillator", Corresponding-Member of the AS UkrSSR, H.S. Pysarenko and Doctor H.I. Dzhanelidze presiding. Junior Scientific Assistant Fedir Yakovych Zahovura, on May 10, 1960, defended his Candidate's thesis on "The Influence of Heat-Regimes with Constant Turning Deflection", Doctor I.V. Krahel's'kyi and Candidate O.Ya. Artamanov presiding. On December 19, 1960, Olexandr Yosypovych Kuyun defended his Candidate's thesis on "Thermal Phenomena in Surface Layers of Metal with Friction, Erosion, and Grinding", Doctor M.P. Braun and Candidate I.H. Hosovs'kyi presiding. 3) Instytut Electro-zvaruvannya im Ye. O. Patona (Ye.O. Paton Electro-Welding Institute): On March 2, 1960, Senior Scientific Assistant, Candidate Borys Izrayil'ovych Medovar defended his Doctor's thesis on "The Welding of Chromo-Nickel Austenite Steels", Academician of the AS UkrSSR, M.M. Dobrokhoto, Corresponding Member of the AS USSR, O.S. Zaymovs'kyi, Doctor K.V. Lyubavs'kyi, and Doctor O.P. Hulayev presiding. On February 22, 1960 Engineer Arkadiy Hryhorovych Potap'yevs'kyi defended his Candidate's thesis on "Implementing the Wel-

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Defence of theses in the ...

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ding Process on Thin Leaves of Steel in a Medium of Carbon Dioxide", Doctor H.I. Pohodin-Aleksyeyev and Candidate F.I. Petrenko presiding. On April 3, 1960, Research-Student Mykola Lukych Kareta defended his Candidate's thesis on "Investigating the Creep of Metals Welded Together with Heat-Resistant Steels", Doctor M.P. Braun and Candidate V.S. Ivanov presiding. 4) Instytut mashinoznavstva ta avtomatyky (Institute of Machine-Science and Automation): On November 24, 1960, Junior Scientific Assistant Yaroslav Yosypovych Burak defended his Candidate's theses on "Some Problems of Torsion and Bending in Prismatic Rods", Doctor Yu.A. Shevlyakov and Candidate V.I. Onyshchenko presiding. 5) Instytut teploenerhetyky (Institute of Thermal Energy): Senior Scientific Assistant, Candidate Oleh Oleksandrovych Kremn'ov, on March 2, 1960, defended his Doctor's thesis on "Theoretical and Experimental Bases for the Thermal Computation of Shafts and Shaft Air-Cooled Generator's", Doctor V.B. Komarov, Doctor F.A. Abramov, and Doctor L.M. Rozenfel'd presiding. 6) Instytut metalokeramiky i spetsialn'ykh splaviv (Institute of Metallo-Ceramics and Special Alloys): On January 5,

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Defence of theses in the ...

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1960, Junior Scientific Assistant Mykola Vasyl'ovych Vasylenko defended his Candidate's thesis on "Some Problems of Bending-Torsion Oscillation of Rods with Non-Symmetric Cross-Section", Academician of the AS UkrSSR, Yu.O. Mytropol's'kyi and Candidate O.O. Horoshko presiding. On January 5, 1960, Junior Scientific Assistant Vasyl' Oleksandrovykh Kuz'menko defended his Candidate's thesis on "The Study of the Characteristic of Stability by Means of High-Frequency Mechanical Oscillations", Corresponding-Member of the AS UkrSSR O.M. Pen'kov, and Candidate M.E. Harf presiding. On June 6, 1960, Junior Scientific Assistant Ihor Andriyovych Kozlov defended his Candidate's thesis on "Experimental Research on the Bearing Capacity of Elements of Rotary Turbines", Doctor D.V. Vaynberh, and Candidate V.H. Popkov presiding. 7) Laboratoriya hidravlichnykh mashyn (Laboratory of Hydraulic Machines): On May 13, 1960, Junior Scientific Assistant Oleksandr Oleksandrovykh Korotkov defended his Candidate's thesis on "Investigation of the Basic Forces of Hydrodynamic Coupling", Doctor S.M. Kutsenko and Docent M.H. Ulyanov presiding.

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S/198/62/008/004/006/006  
D407/D301

AUTHOR: Botte, O.V.

TITLE: Session of the engineering-sciences division of the  
Academy of Sciences of the UkrRSR

PERIODICAL: Prykladna mekhanika, v. 8, no. 4, 1962, 458 - 461

TEXT: The session was held in Kiyev, from February 21 - 23, 1962. It reviewed the activity of the past year (1961), as well as the objects for 1962 and the following two decades. The future development of scientific investigation was viewed in the light of the resolutions of the 22-nd Party-Congress and the new Party-Program. About 200 people took part, including representatives of the State-Planning Committee, Water-Economy, River Transport, Kiyev University and Polytechnic, Agricultural Academy, and various factories. The head of the division, H.V. Samsonov (Member-Correspondent of the AS UkrRSR), reported on the past activity and the future objects. The structure and activities of the Division were reorganized for the purpose of raising the theoretical

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Session of the engineering-sciences ... S/198/62/008/004/006/006  
D407/D301

level of the executed works, and for concentrating scientific personal and material resources for the solution of the most important problems. New institutions were set up for the development of technical cybernetics, for the study of the history of natural sciences and engineering sciences, the development of new technological materials, the use of the natural resources of the Donbas (Donets Basin), of non-ferrous and steel casting, etc. In 1961, a great deal was undertaken for the popularization of scientific works. The main future objects relate to complex automation and mechanization, the development of new technological processes in industry, the use of natural resources, the development of new apparatus, etc. Serious shortcomings in the activities of the Division were noted in fields, such as: the application, in the national economy, of the results of scientific investigations, the training of qualified personal, and the publication of scientific material. During the session, 14 reports were presented, on subjects such as the development of new highly-productive technological processes in machine-building, the development of new methods for coal mining and of other minerals, new machines for industrial automation, nuclear physics and atomic energy,

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Session of the engineering-sciences ...

S/198/62/008/004/006/006  
D407/D301

physico-chemical mechanics of materials, metals and metallurgy, semi-conductors and semiconductor instruments, the direct conversion of heat into electricity, the purification of air and water from industrial pollutions, theory of strength and plasticity, high-temperature thermodynamics and physics. ✓

Card 3/3

BOTTE, O.V.

Defense of dissertations in the field of mechanics in the  
institutions of the Department of Mechanics of the Academy  
of Sciences of the Ukrainian S.S.R. Prykl.mekh. 8 no.5:  
571-575 '62. (MIRA 15:9)  
(Academy of Sciences of the Ukrainian S.S.R.)

SANTA, N.; BOTTESCH, A.

Research on certain lipases in cultured carps. Rev biol 5 no.4:  
363-372 '60. (REAI 10:9)

1. Laboratoire de Physiologie animale. Centre de Recherches de  
Biologie de l'Academie de la Republique Populaire Roumaine.

(Carp) (Lipase)

SANTA, N.; BOTTESCH, A.

Research on certain lipases in cultivated carps. Studii cerc biol  
anim 13 no.2:143-153 '61.

1. Laboratorul de fiziologia animalelor si a omului, Facultatea de  
stiinte naturale, Universitatea C. I. Parhon, Bucuresti. Comunicare  
prezentata de Eug. A. Pora, membru corespondent al Academiei R.P.R.

(CARP) (LIPASE)

CHIOSA, L.; MUNTIU, N.; IONESCU-STOIAN, Fl.; TAUTU, S.; BOTTESCH, A.

Relationship between the response to pyrogenic substances and capacity of producing lytic antibodies in rabbits. Studii cerc fiziol 6 no.1:27-33 '61. (EEAI 10:9)

1. Institutul de control de stat al medicamentelor si cercetari farmaceutice. 2. Membru de redactie, "Studii si cercetari de fiziologie" (for Chiosa).

(FEVER) (LYSINS) (ANTIGENS AND ANTIBODIES)



BOTTERI, Ivan Hugo, Dr.

Review of our research in the field of echinococcosis. Lijec.vjes.  
76 no.9-10:435-438 1954.

(ECHINOCOCCOSIS, ther.

echinococcal antigen (Ser))

(ANTIGENS AND ANTIBODIES

echinococcal antigen, ther. of echinococcosis(Ser))

BOTTGER, E.

EE

ANDOR, T., MD; BOTTGER, E., MD.

Polyclinic of the Unified Hospital in Beius (Policlinica  
Spitalului unificat din Beius) - (for all)

Bucharest, Viata Medicala, No 1, 1 Jan 64, pp 27-31

"Exploratory Duodenal Catheterization in Ambulatory Medical  
Care."

S/262/62/000/001/001/010  
I014/I252

**AUTHOR:** Böttger, Josef

**TITLE:** Combustion chamber with localized ignition of mixture

**PERIODICAL:** Referativnyy zhurnal, Silovyye Ustanovki, No. 1, 1962, 69, abstract 42. 1. 362 p (Czech. patent, class 46a<sup>2</sup>, 79/10, no. 90574, June 15, 1959)

**TEXT:** A Diesel engine is patented, having a combustion chamber in the form of a solid of revolution inside the piston and a single-hole or pin atomizer, spraying the fuel on the chamber wall. The main portion of the fuel hits the cold part of the chamber, while a smaller portion of the jet, at the end of the injection, hits the hotter part (the edge of the hole) and causes localized ignition of the mixture. In order to regulate air circulation the chamber is displaced with respect to the piston axis of its inlet orifice displaced with respect to the chamber axis. A curved inlet channel in the cylinder head is provided for the same purpose. The injector is inclined and displaced with respect to the cylinder axis.

[Abstracter's note: Complete translation.]

Card 1/1

S/273/63/000/001/007/013  
A052/A126

AUTHOR: Böttger, Josef

TITLE: Diesel combustion chamber

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk, 39. Dvigateli vnutrennego  
agoraniya, no. 1, 1963, 23 - 24, abstract 1.39.157 P (Czech. pat.,  
cl. 46c<sup>1</sup>, 8, 46a<sup>2</sup>, 79/01, no. 98392, February 15, 1961)

TEXT: The combustion chamber opening in the piston bottom (see Fig.) has outlines corresponding to the streams of the air eddied in the cylinder. This is achieved in such a way that part of the air streams cool the most heated parts of the chamber edge. In the depth of the chamber the intensity with which its walls are cooled decreases. The diameter of the chamber, the angles of incline  $\alpha$  and  $\alpha'$  are selected experimentally so that the temperatures of the chamber walls are most favorable. The injected fuel is carried away by air streams to the zones of increasing temperatures (in the direction of the arrows). From inside the piston bottom is cooled by a stream of oil supplied fan-shaped by a jet from the crankcase. The intensity of the bottom cooling depends on the cetane

Card 1/2

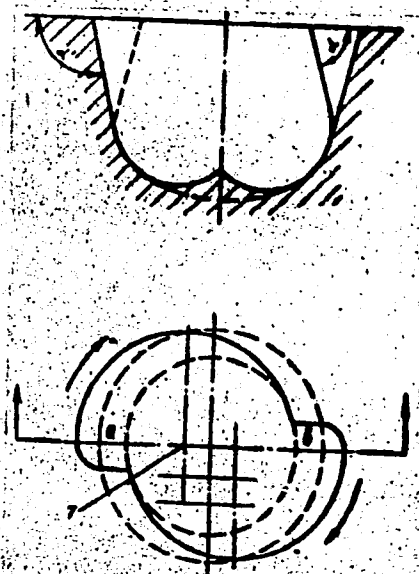
Diesel combustion chamber

number of the fuel and is controlled by a corresponding throttle device. There are 3 figures.

A. Zhukov

[Abstracter's note: Complete translation]

S/273/63/000/001/007/013  
A052/A126



Card 2/2

BOTTGER, Josef, inz.

End of the row on noiseless combustion. Automobil Gz 8 no.8:  
18 Ag\*64

BOTTGER, J., inz.

The Vibe theory of mixture combustion in engines from the  
viewpoint of combustion engine noisiness. Automobil Cz  
9 no.3:21-25 Mr '65.

BOTTKA, P.

BOTTKA, P. - Development trends in the industries of optical and precision mechanics in foreign countries. p. 93.  
Vol. 2, no. 4, Aug. 1956.  
Képes Híradótechnika. Budapest, Hungary.

SOURCE: East European Accessions List (EEAL) Vol. 6, No. 4--April 1957



BOTTLIK, Mihaly

On the "Guide for designers" describing building materials and products. Epites szemle 7 no.1:22-24 '63.

1. Epitesgazdasagi es Szervezesi Intezet tudomanyos munkatarsa.

Bittner, H.

PH  
HG  
\*The Crystal Structure of PdZn. H. Nowotny and H. Bittner *Zentralblatt*, 1950, 81, 670-680; *C. Abs.*, 1951, 43, 3217. —X-ray powder-diagram data for the PdZn alloy heated to 650° C. and recrystallized are tabulated. The indices indicate a b.c. tetragonal cell structure of the Li type  $d = 10.1 \text{ g/cc}$ .

of Sm ①

BITTNER, Halina; GODLEWSKA-VETULANI, Maria

Tuberculous osteitis of the jaws in children and a contribution to its therapeutic management. *Pediatr pol.* 36 no.11:1153-1159 N '61.

1. Z Kliniki Chirurgii Stomatologicznej AM w Poznaniu Kierownik:  
doc. dr med. J. Stadnicki.

(TUBERCULOSIS OSTEOARTICULAR in inf & child)  
(JAWS dis)

BITTNER, Halina

The course of osteogenesis of the infected alveolus under the effect of lyophilized amnion. (Histological study). Czas. stomat. 19 no.1:51-57 Ja ' 66

1. Z Kliniki Chirurgii Stomatologicznej AM w Poznaniu (Kierownik: prof. dr. J. Stadnicki).

KALDOR, Istvan, dr.; BOTTYAN, Etelka, dr.

The development of carcinoma in lupus erythematosus. Borgyogy.  
vener. szemle 38 no.5:218-219 0 '62.

1. A Budapesti Orvostudományi Egyetem Bor- és Nemikortani Klinika  
(igazgató: Foldvari Ferenc dr., egyetemi tanár) közleménye.  
(LUPUS ERYTHEMATOSUS, DISCOID) (CARCINOMA, EPIDERMOID)  
(SKIN NEOPLASMS)

DOMONKOS, Robert, dr.; BOTTIAN, Etelka, dr.

Drug side-effects in 2 cases of subacute lupus erythematosus.  
Borgyogy vener. szemle. 40 no.4:180-182 Ag '64.

1. A Budapesti Orvostudományi Egyetem Bor- és Nemikortani Klinika  
(Igazgató: Foldvári Ferenc dr. egyetemi tanár) közleménye.

BOTTYAN, I.

Clinical studies with the granuloma antigen. Acta med. hung. 3 no.1:63-72 1952. (GIML 23:4)

1. Of the Stomatological Department of Istvan Hospital in Budapest.

EXCERPTA MEDICA Sec 6 Vol 13/7 Internal Med. July 50

3291. BOTTYÁN-TEST - Bottyán L. I. Gellértheügy. 1, Budapest - THERAPIE-  
WOCHE 1958, 8/10 (439-440) Tables 3

An antigen was made from material from dental granulomas by lyophilization, and frozen at -40°C. This is called 'the Bottyán antigen', and an intracutaneous (i. c.) test with it is recommended, with observation of the primary and secondary reactions, followed by a s. c. test on the next day with assessment of the focal and general reactions, and, if necessary, passive transmission to guinea-pigs. When both the s. c. and i. c. reactions are positive, a correlation between the pathological phenomena and the focus is assumed, and the removal of the latter is then indicated. In all, 2,770 cases have now been tested by several authors, with positive results in 52.6% of cases with varying pathology and in 86% of rheumatic patients.

Gsell - Basle (L, 6)



BOTTYAN, Olga; DEZSO, Gyula; EIBEN, Otto; FARKAS, Gyula;  
RAJKAI, Tibor; THOMA, Andor; VELI, Gyorgy

Observations on the beginning of the menstruation in  
Hungary. Elovilag 9 no.2:16-18 Mr-Apr '64.

BOTUK, B.O., professor (Odessa).

"New studies and hydraulic calculations of sewer systems" by  
N.F. Fedorov. Reviewed by B.O. Botuk. Vod. i san. tekhn. no.2:  
39-40 F '57. (Sewer design) (Fedorov, N.F.) (MLRA 10:6)

BOTUK, B.O.; DMITRIYEVSKIY, N.G.; ALEKSEYEV, Yu.S.

Effect of the lateral current compression at the jump entrance on the  
coefficient of velocity of the hydraulic jump. Izv.vys.ucheb.zav.;  
stroit. i arkhitekt. no.5:119-125 '58. (MIRA 12:1)  
(Hydraulic jump)

BOTUK, B.O.

"Modern methods for mechanical purification of sewage" by  
S.M.Shifrin. Reviewed by B.O.Botuk. Vod.1 san.tekh. no.9:  
39-40 S '59. (MIRA 12:12)  
(Sewage--Purification) (Shifrin, S.M.)

BOTUK, B.O. (Odessa); IMITRIYEVSKIY, N.G. (Odessa); SAVCHENKO, G.D.  
(Odessa); ALEKSEYEV, Yu.S. (Odessa)

Efficient type of distributing structures in sewage purification  
works. Vod. i san. tekhn. no. 4:22-24 Ap '60.

(MIRA 13:6)

(Sewage--Purification)

BOTUK, B.O. (Odessa)

Some notes on the calculation of aeration tanks. Vod. 1  
san. tekhn. no. 2:28-31 F '61. (MIRA 14:7)  
(Sewage—Purification)

BOTUK, B.O. (Odessa)

Biochemical oxygen requirement rates for domestic sewage in  
the calculation of purification works. Vod. i san. tekhn.  
no.7:18-19 JI '61. (MIRA 14:7)  
(Sewage—Purification—Biological treatment)

BOTUK, Boris Osipovich, doktor tekhn. nauk, prof.; BOGOMOLOV, A.I.,  
prof., retsenzent; BOGOMOLOV, A.I., red.; SHAROVA, Ye.A.,  
red. izd-va; YEZHNOVA, L.L., tekhn.red.

[Hydraulics]Gidravlika. Moskva, Vysshaya shkola, 1962.  
449 p. (MIRA 15:11)  
(Hydraulics)



BOTUK, B.O., prof. (Odessa)

Some problems of nonuniform flow in round pipes. Vod. 1 san.  
tekh. no. 2:18-22 F '64 (MIRA 18:2)

TUROVA, F.D.; BOTUNOVA, L.M.; BOSIK, R.N.; DEMCHENKO, M.P.; VOL'MAN, I.B.

Care of convalescents following pneumonia. *Pediatrics* 38 no. 3:72-75  
Mr '60. (MIRA 14:1)

(PNEUMONIA)

BOTUSHAROV, T., inzh.

Flame tempering of locomotives and machine parts, and its economic effect. Transp delo 6 no.7:17-21 '54.

1. Upravlenie Promishlenost po transporta.

PLATIKANOV, Nikola; CHESHMEDZHIEV, B.; DZHAROVA, M.; ~~POTUSHAROVA~~, E.

Problem of making the  $\text{Cr}_2\text{O}_3$  indicator method more accurate in determining the digestibility of rations. Izv Zhivotn nauk 1 no.2:15-34 '64.

1. Institute of Animal Husbandry, Kestimbrod. 2. Corresponding Member of the Bulgarian Academy of Sciences, and Member of the Board of Editors, "Izvestiia na Akademiiata na selektsionanskite nauki - Zhivotnovudni nauki" (for Platikanov).

NIKOLAEV, Ig. A.; BOTUSHAROVA, L. G.

On the problem of the prognosis of acute infectious hepatitis in  
Bulgaria. Izv. inst. klin. obsht. med. 4:337-346 '60.

(HEPATITIS INFECTIOUS statist)

BOTUT', B.V.; FEDOROV, F.I.

On the theory of the optical activity of crystals. Part 3:  
General equation of optical activity of crystals. Part 3: General  
equation of normals. Opt. i spektr. 6 no.4:537-541 Ap. '59.

(MIRA 12:5)

(Crystals--Optical properties) (Wave mechanics)

KOKHAN, M.A.; BOTUZ, I.N.

~~SECRET~~  
Control of the blowing through of boilers. Sakh.prom. 27 no.10:31-32 '53.  
(MIRA 6:11)

1. Khodorovskiy sakharney savod.

(Steam boilers)

HORACEK, V.; BOUCEK, Z.

Central luxation of the mandibular capitulum and ear complications.  
Cesk.otolar.9 no.5:310-312 O'60.

1. Otolaryngologicke oddeleni, prim. MUDr. F. Horacek, stomatologicke oddeleni, prim. MUDr. Z. Boucek, KUNZ, nemocnice v Pardubicich.  
(MANDIBLE fract & disloc)  
(OTITIS case reports)  
(MASTOIDITIS case reports)



BOTVICH, K.N.

Means for the mechanization of engineering and management  
work. Mashinostroitel' no.9:9-12 S '65.

(MIRA 18:12)

BOTVIN, A.N., mekhanik.

Drum separator. Suggested by A.N. Botvin. Torf. prom. 30 no.5:30 My '53.  
(MLRA 6:5)

1. Torfopredpriyatiya "Vasilyevskiy mokh". (Separators (Machines))

MATEVSKIY, V.Ya., inshener; BOTVIN, P.Ya., inshener.

Centralized delivery of petroleum products. Neftianik 1 no.1:25-27  
Ja '56. (MIRA 9:7)

1.Ukrnefteshta.  
(Petroleum--Transportation)

BOTVIN, K. M.

Botvin, M. P.

"Investigation of the grasping of timber by conveyor equipment equipped with lugs." Min Higher Education USSR. Forestry Engineering Academy imeni S. M. Kirov. Leningrad, 1956. (Dissertation for the Degree of Candidate in Technical Sciences).

SO: Knizhnaya letopis'

No. 25, 1956. Moscow

LINEV, S.; BOTVIN, N. (Vologodskaya obl.); LISTOPAD, G. (Vologodskaya obl.); SHIBAYEV, V. (Volgograd); BOGDANOV, G., pomoshchnik instruktora profilaktiki (Knybyshevskaya obl.); PANOV, A., pomoshchnik instruktora profilaktiki (Knybyshevskaya obl.); GRINKEVICH, S. (Novosibirskaya obl.); SLUPKO, A. (Karel'skaya ASSR); LAVRENKOV, I. (g. Vladimir) sibirskaya

Readers' letters. Pozh.delo 8 no.5:29 My '62. (MIRA 15:5)

1. Glavnyy inzh. lesoperevalochnoy bazy, pos.Malinovka, Kemerovskaya obl. (for Linev).

(Fire prevention)

TLEUBERGENOVA, G.; BOTVIN, V.

Splitting of heavy and light nuclei of an emulsion by protons  
with an energy of 660 Mev. Vest.AN Kazakh.SSR 16 no.8:32-43  
Ag '69. (MIRA 13:9)  
(Nuclei, Atomic) . (Protons)

S/020/60/135/003/017/039  
B019/B077

AUTHORS: Takibayev, Zh. S., Academician of the Kazakhskaya SSR,  
Botvin, V. A., and Chasnikov, I. Ya.

TITLE: An Analysis of Some Inelastic p-n Interactions at an Energy  
of 9 Bev <sup>19</sup>

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 3, pp. 571-572

TEXT: In an emulsion pile - НИКФИ-Р (NIKFI-R) emulsions - exposed in the proton synchrotron of the Ob'yedinennyi institut yadernykh issledovaniy (Joint Institute of Nuclear Research) some events of inelastic p-n interaction were discovered. Out of 72 recorded events with three-pronged stars 22 were found where the complete identification of all secondary charged particles was possible. Ionization measurements and multiple Coulomb scatterings were used to identify these particles. The authors conclude from the studies of the angular distribution of the  $\pi$  mesons and the protons that the asymmetric angular distribution (measured to  $\Delta \approx 0.55 \pm 0.24$ ) of the forward scattered secondary charged

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An Analysis of Some Inelastic p-n Interactions at an Energy of 9 Bev

S/020/60/135/003/017/039  
B019/B077

particles for the p-n interaction in the center of mass system cannot be caused through the protons; (the proton angular distribution is practically symmetric but that of the pions is strongly asymmetric.) In order to guarantee this opinion further tests have to be carried out. The mean energy value of the protons and  $\pi$  mesons determined in the center of mass system amounts to  $\bar{E}_p = 1.303 \pm 0.043$  Bev and  $\bar{E}_\pi = 0.436 \pm 0.030$  Bev and the transverse impulse is  $\bar{P}_p = 0.244 \pm 0.032$  Bev/c and  $\bar{P}_\pi = 0.158 \pm 0.022$  Bev/c. Future publications are announced. There are 2 figures and 5 Soviet references.

SUBMITTED: May 16, 1960

Card 2/2



BOTVIN, V.A.; TAKIBAYEV, Zh.S.; CHASNIKOV, I.Ya.; PAVLOVA, N.P.; BOOS, E.G.

Study of three-pointed stars resulting from inelastic pn-  
interactions in a nuclear emulsion at an energy of 9 Bev. Zhur.  
eksp.i teor.fiz. 41 no.4:993-1002 0 '61. (MIRA 14:10)

1. Institut yadernoy fiziki AN Kazakhskoy SSR.  
(Photography, Particle track) (Protons) (Neutrons)

39305  
S/707/62/005/000/001/014  
D290/D308

24.6700

AUTHORS:

Botvin, V.A., Takibayev, Zh.S., Chasnikov, I.Ya.,  
Boos, E.G. and Pavlova, N.P.

TITLE:

Analysis of some inelastic p-n-interactions at 9 Bev

SOURCE:

Akad iya nauk Kazakhskoy SSR. Institut yadernoy  
fiziki Trudy. v. 5, Alma-Ata, 1962. Fizika chastits  
vysokikh energiy. Struktura yadra, 3-15

TEXT:

The authors studied in detail the characteristics of  
the secondary particles from three-ray p-n-interactions produced by  
9 Bev protons; the work was carried out because of appreciable dif-  
ferences in the results for such reactions given in the literature.  
Nuclear emulsions type НИКФИ-Р (NIKFI-R) were used. The aggregate  
angular distribution of  $\pi$ -mesons and protons is symmetrical in the  
center-of-mass system (CMS); the individual angular distribution for  
 $\pi$ -mesons and protons are asymmetric in CMS, protons predominating  
in the back direction and  $\pi$ -mesons in the forward direction. The  
energy spectrum of protons in CMS is harder than that predicted by

Card 1/2

S/707/62/005/000/001/014  
D290/D308

Analysis of some inelastic ...

the statistical theory with allowance for isobars. The energy spectrum of  $\pi$ -mesons in CMS at high energies approximates to a Heisenberg spectrum, except that the maximum in the theoretical spectrum occurs at an appreciably lower energy; the spectrum predicted by the statistical theory with allowance for isobars is harder for all energies. The measured inelasticity coefficients show that for protons and  $\pi$ -mesons half the energy concerned in meson production is carried away by  $\pi^0$ -mesons; this indicates that equal numbers of  $\pi^0$ - and  $\pi^\pm$ -mesons are produced provided that the energy spectra of neutral and charged mesons are identical. The average energy carried away per charged  $\pi$ -meson or proton does not depend on the type of reaction. The distribution of the true inelasticity coefficient does not show a sharply defined maximum; there are indications of the presence of two maxima but this is only a tentative conclusion. There are 13 figures and 4 tables.

Card 2/2

24.6700

39306

S/707/62/005/000/002/014  
D290/D308

AUTHORS:

Boos, E.G., Takibayev, Zh.S., Botvin, V.A., Chasnikov, I.Ya. and Pavlova, N.P.

TITLE:

Analysis of p-nucleon interactions produced at an energy of  $10^{10}$  eV in nuclear photoemulsion

SOURCE:

Akademiya nauk Kazakhskoy SSR. Institut yadernoy fiziki. Trudy. v. 5. Alma-Ata, 1962. Fizika chastits vysokikh energiy. Struktura yadra, 16-32

TEXT:

The authors have developed a new method of finding the angular and energy characteristics of nuclear disintegrations that is based on the calculation of the distribution of transverse momentum of secondary particles; for all identifiable particles the method gives closer agreement with experiment than other methods of approximation. The method permits an estimate of the dependence of the following characteristics on observed multiplicity: a) the degree of anisotropy of the angular distribution of shower particles in the center-of-mass system (CMS) for a Lorentz-factor ( $\gamma_c$ ) of 2.4 decreases with increasing multiplicity; for 3- and 8-ray stars

Card 1/3